SOV/120-5-1-[illegible]

AUTHORS: Vasil'yev, ... A. and [illegible], A. A.

TITLE: The Efficiency of an En-Window Counter as a Function of the Hardness of β-Spectrum (Effektivnost' tortsa ... v zavisimost. ot zhestkosti beta-spektrov)

PERIODICAL: Pribory i tekhnika eksperimenta, 1957, Nr. 1, pp. [illegible] (USSR)

ABSTRACT: The [illegible] activity of a number of [illegible] ration products such as $Br^{[illegible]}$ ([illegible] hours), $Sr^{[illegible]}$ [illegible], Ag^{113} (5.3 hours), Cd^{117} (2.8 hours) and Ba^{139} (1.4 [illegible]) was measured. It was not possible to obtain these isotopes with a sufficiently high specific activity and [illegible] presence of an inactive carrier in the purified [illegible] isotopes and other disintegration products must [illegible] not possible to carry out accurate measurements in a 4π [illegible] ter. Furthermore, the low half-life of these isotopes [illegible] difficult to determine the efficiency of an en-window [illegible] using a 4π counter since this is a long procedure. For [illegible] reason measurements of the efficiency of a counter [illegible] ... ses of isotopes with single β-spectra and different [illegible] β-particle energies were undertaken. From such data it [illegible] possible to determine the dependence of the efficiency [illegible] maximum energy of the β-spectrum. In this it is assumed that

Card 1/4

SOV/120-5[illegible]-1-[illegible]

The Effici[illegible] E[illegible]-W[illegible] F[illegible]
of β-Spectrum

[illegible] efficiency [illegible] depend on the [illegible] β-spectra. The work [illegible] out in [illegible] 4π [illegible] which was of [illegible] form [illegible] meter of the count[illegible] counter was fill[illegible] with [illegible] methane at [illegible]. In each measurement the [illegible] the absolute activity of the specimen was [illegible]. [illegible] film (10-15 microgram/cm[illegible]). It was then [illegible] ferred together with the film on to an aluminium foil [illegible] had an aperture for the [illegible] and was measured in [illegible] 4π counter. The [illegible] was compared with another 4π [illegible] whose efficiency is assumed to be 100%. R[illegible] parison is shown in Fig 1 from which it follows [illegible] efficiency is independent of the energy of the β [illegible] is on the average equal to 0.[illegible]. The [illegible] shown in F[illegible] 1 [illegible] Results obtain[illegible] are [illegible] in Table [illegible] and F[illegible].

Card 2/4

The Efficiency of an End-Window Counter as a Function of the Hardness of β-Spectrum

the absolute counting efficiency is shown as a function of the surface density of the specimen for various energies. Experiments show that the absorption within the specimen strongly depends on the maximum energy in the β-spectrum. This effect reduces the efficiency by a factor of 3 for low energy radiation. For high energy radiation (of the order of 1.5 MeV) the efficiency is independent of surface density in the range 1-20 mg/cm^2. The counting efficiency at a given surface density may be represented as a function of the maximum energy of the β-emitter. This function is shown in Fig 3 for a layer 5 mg/cm^2 thick. The curve consists of two very different sections. The first section shows the very strong dependence of the efficiency on energy up to, say, 0.5 MeV and beyond this point the efficiency is independent of the maximum energy of the β-spectrum. It follows from Fig 4 that within experimental error the absolute efficiency is independent of the form of the β-spectrum since different emitters were used to plot this figure. The relative solid angle of the counter

Card 3/4

The Efficiency of an End-Window Counter as a Function of the Energy of β-Spectrum

was 0.111. There are [illegible] figures, 1 table and [illegible] references [illegible] of the references are Soviet and 1 is English.

ASSOCIATION: Leningradskiy tekhnologicheskiy institut (Leningrad Technological Institute)

SUBMITTED: January 31, 1958

Card 4/4

ROMANOV, Yu.F.; PETRZHAK, K.A.; BAK, M.A.

Cadmium ratios for Ag^{107} and Ag^{109}. Trudy Radiev.inst.AN SSSR 9:84-86 '59. (MIRA 14:6)

(Silver--Isotopes) (Cadmium)

BAK, M.A.; PETRZHAK, K.A.; ROMANOV, Yu.F.

Analysis of a neutron field of uniform density. Trudy Radiev.inst. AN SSSR 9:87-90 '59. (MIRA 14:6)
(Neutrons)

KHAZOV, Yu.L.; BAK, M.A.; PETRZHAK, K.A.; ROMANOV, Yu.F.

Energy distribution of neutrons in the water surrounding the source.
Trudy Radiev.inst.AN SSSR 9:91-103 '59. (MIRA 14:6)
(Neutrons)

ROMANOV , Yu.F.; PETRZHAK, K.A.; BAK, M.A.

Measurement of the diffusion length of thermal neutrons in water.
Trudy Radiev.inst.AN SSSR 9:104-106 '59. (MIRA 14:6)
(Neutrons)

BAK, M.A.; GORSHKOV, G.V.; MATVIYENKO, V.I.; PETRZHAK, K.A.; ROMANOV, Yu.F.

Radon neutron sources. Trudy Radiev.inst.AN SSSR 9:107-112 '59.
(MIRA 14:6)

(Neutrons) (Radon)

BAK, M.A.; GOLSHKOV, G.V.; MATVIYENKO, V.I.; PETRZHAK, K.A.; SHIMANSKAYA, N.S.

Determination of the neutron yields of the sources Ra + Be, Ac + Be, MsTh + Be, and P + Be. Trudy Radiev.inst.AN SSSR 9:120-125 '59. (MIRA 14:6)

(Neutrons)

BAK, M.A.; PETRZHAK, K.A.; ROMANOV, Yu.F.

Wall effect in ionization chambers. Trudy Radiev.inst.AN SSSR 9.192 206 '59. (MIRA 12:6)

(Ionization chambers)

MALKIN, I.Z.; PETRZHAK, K.A.; YAKOVLEV, V.A.

Effect of alpha-particle reflection during measurements in a 2π solid angle chamber. Trudy Radiev.inst.AN SSSR 9:207-213 '59. (MIRA 14:6)

(Alpha rays) (Ionization chambers)

BUGORKOV, S.S.; MALKIN, L.Z.; PETRZHAK, K.A.; YAKOVLEV, V.A.; YAKUNIN, M.I.

Ionization chambers for α-particle counting. Trudy Radiev.inst. AN SSSR 9:214-228 '59. (MIRA 14:6)
(Ionization chambers) (Alpha rays)

PETRZHAK, K.A.; NIKOL'SKAYA, Ye.B.; PETROV, Yu.G.; SHLYAMIN, B.A.

Possibility of using a method involving the slowing down and collection of fission fragments of gas for the study of fragment isotopes. Part 1: Radiochemical study of the distribution of fragments from their paths. Radiokhimiia 1 no.2:227-230 '59. (MIRA 12:8)

(Fission products)

Petrzhak, K A.

21(8)
AUTHORS: Bak, M. A., Bugorkov, S. S., Il'inskaya, T. A., Petrov, Yu. G., Petrzhak, K. A., Solntsev, V. M., Sorokina, A. V., Ushatskiy, V. N. SOV/89-6-5-18/33

TITLE: The Yield of Ru^{103} and Ru^{106} in the Fission of U^{235} and Pu^{239} by Fast Neutrons (Vykhody Ru^{103} i Ru^{106} pri delenii U^{235} i Pu^{239} bystrymi neytronami)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 5, pp 577-578 (USSR)

ABSTRACT: The yields of Ru^{103} and Ru^{106} were determined by means of a relative measurement with respect to the Mo^{99}-yield. Uranium oxide (U^{235}-enrichment >90 %) and plutonium oxide were pressed in aluminum caskets. The latter were surrounded by a 1 mm thick Cd-sheet, and the whole was packed in a firmly closed aluminum cylinder. The cavities are filled with boron carbide (all-round thickness at least 2 cm). Two samples were made from uranium and 4 from plutonium, and were irradiated for 52.2 hours in a water-filled beam tube of the heavy-water reactor of the AN SSSR (AS USSR). The neutron spectrum is characterized by the ratio

Card 1/3

The Yield of Ru^{103} and Ru^{106} in the Fission of U^{235} and Pu^{239} by Fast Neutrons

$E_n > 1.5$ Mev : $E_n > 2.5$ Mev = 4.0 ± 1.5. From the irradiated samples Ru and Mo was chemically separated, after which thin β-preparations (thickness $< 20\ \mu g/cm^2$) were produced on an organic foil; their activity was measured by means of a 4π-counter. An aluminum filter of 3 mg/cm^2 thickness is attached, so that only the β-rays of Ru^{103} and Ru^{106} reach the counter. Determination of the absolute activity of Ru^{103} and Ru^{106} was carried out by means of further filtering and recording the absorption curves of these radiating bodies with the same numbers. The momentum values measured make it possible, from 2 equations with 2 unknown ratios to calculate the latter. Herefrom it is possible to calculate the absolute fractions. From the latter and from the measured absolute Mo^{99}-β-activity (which will be dealt with by a publication in the near future) it was possible to calculate the following yields:

The Yield of Ru^{103} and Ru^{106} in the Fission of U^{235} and Pu^{239} by Fast Neutrons

SOV/89-6-5-18/33

	Ru^{103}	Ru^{106}
Pu^{239}(n,f)	5.7 ± 1.0 %	4.6 ± 0.8 %
U^{235} (n,f)	3.2 ± 0.6 %	0.71 ± 0.12 %

There are 1 figure, 1 table, and 1 Soviet reference.

SUBMITTED: December 22, 1958

Card 3/3

21(8)
AUTHORS: Kovrigin, B. S., Kirillov [illegible] M. Ya. [illegible]
Petrzhak, K. A.

TITLE: The Energy Spectrum of the Fragments of the Photofission of U^{238} (Energeticheskiy spektr oskolkov fotodeleniya [illegible])

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 1, pp 315-317 (USSR)

ABSTRACT: In the present paper the energy spectrum mentioned in the title is determined at a maximum energy of 12,5 Mev of the betatron γ-radiation. The apparatus used for measuring the kinetic energy of the fragments of photofiss[illegible] consisted of a differential pulse-ionization chamber, an amplifier channel, and an electron pulse oscillograph with photorecording. The axis of the ionization chamber in operational position formed an angle of 15° with the axis of the beam. A diagram of the energy spectrum of the fragments of the photofission of U^{238} at a maximum energy of 12,5 Mev of betatron bremsstrahlung. [illegible] of the same apparatus and [illegible] same preparation also the energy distribution of the fragments of the fission of

Card 1/3

The Energy Spectrum [illegible]

Photofission of ^{238}U

[illegible] is shown [illegible] the of recent [illegible] photofission fragments has the [illegible] 55.1 ± 1 and [illegible] fragments. If the [illegible] is taken into account, [illegible] 5 Mev. The two spectra differ mainly [illegible] height of the "valley" between the two [illegible] of the peak of the light fragments. In the [illegible] photofission at 9 Mev, and in the spectrum of spontaneous fission [illegible]. The difference may be [illegible] excitation of the nucleus in photofission and also to the superposition of fluctuations of the compensated γ- background. In spite of the considerable excitation energy, no essential increase of the most probable energies of fragments and of the kinetic energy in photofission compared to spontaneous fission was observed. The peak [illegible] photofission spectrum are somewhat more close to the another than the corresponding peaks of the spectrum of spontaneous fission

Card 2/3

The Energy Spectrum of the Fragments of the [illegible]
Photofission of U^{238}

There are 2 figures, and 1 reference, 2 of which are Soviet.

ASSOCIATION: Leningradskiy tekhnologicheskiy institut (Leningrad Technological Institute)

SUBMITTED: June 24, 1959

Card 3/3

21 (7)
AUTHORS: Dmitriyev, V. N., Drapchinskiy, L. V., SOV/20-127-3-14/71
Petrzhak, K. A., Romanov, Yu. P.

TITLE: Energy Distribution of the Fragments From a Triple Fission of Uranium Nuclei Under the Action of Neutrons

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 3, pp 531 - 533 (USSR)

ABSTRACT: In the fission of the U^{235} nucleus by slow neutrons a far-reaching α-particle forms (Refs 1-4) besides two fragments with comparable mass. Allen and Dewan (Ref 2) used a double ionization chamber with target for investigating the energy distribution mentioned in the title. The chamber for recording the fission fragments had a grid, the other, used for recording the far-reaching α-particles, was separated from the target by a foil. The amplitude distribution of the fragment momenta of a triple fission was determined by means of a 30-channel amplitude analyzer. The energy distribution of the fragments originating from triple- and a double fission of U^{235} according to data from Allen and Dewan are shown by figure 1. In the present paper more exact investigations of the energy

Card 1/4

Energy Distribution of the Fragments From a Triple SOV/20-127-[illegible]
Fission of Uranium Nuclei Under the Action of Neutrons

distribution of a triple fission were carried out. The influ-
ence exercised by the angular correlation was excluded by
using a cylinder-symmetric grid which was fixed symmetrically
to the plane of the central electrode. On the central electrode
the uranium target was fastened onto a silver layer. The ef-
fective solid angle of the α-chamber amounted to 12.[illegible]% of 4π.
The target was irradiated by neutrons of the reactor spectrum
from the physical reactor of the AS USSR. The spectrum of the
pulse amplitudes was recorded in a 30-channel pulse analyzer
with electron brain. The simultaneously arriving pulses of
α-particles and fragments were counted. The ionization in the
fission chamber was taken into account. From the results ob-
tained (Fig 1) the following was found. The spectra of fission
into two and into three fragments are of analogous shape. With
respect to fission into two fragments there is a shift of peaks
toward the range of lower energies. Shifting of the peaks of
the light fragments is greater than that of heavy fragments.
Thus, there is such a thing as a slight approach of peaks. The
ratio of peak heights is 1.[illegible] compared to 1.48 in the double

Card 2/4

fission of U^{235}. Likewise, the half width of the peak of heavy fragments is smaller in the case of triple fission. On the other side of the central electrode in the chamber, peaks are further shifted because of the slowing-down of the fragments in the film- and silver layer upon which the U^{235} was applied. Figure 2 shows the energy distribution for the double and triple fission of U^{233}. The fundamental parameters of this distribution are analogous to that of U^{235}. The sum of kinetic energy by which the two peaks (of light and heavy fragments) are shifted with respect to double fission is 17 Mev which about corresponds to the 15 Mev required for the departure of α-particles. There are 2 figures and 5 references, 2 of which are Soviet.

Energy Distribution of the Fragments From a Triple SOV/20-127-[illegible]
Fission of Uranium Nuclei Under the Action of Neutrons

ASSOCIATION: Radiyevyy institut im. V. G. Khlopina Akademii nauk SSSR (Radium Institute imeni V. G. Khlopin of the Academy of Sciences, USSR)

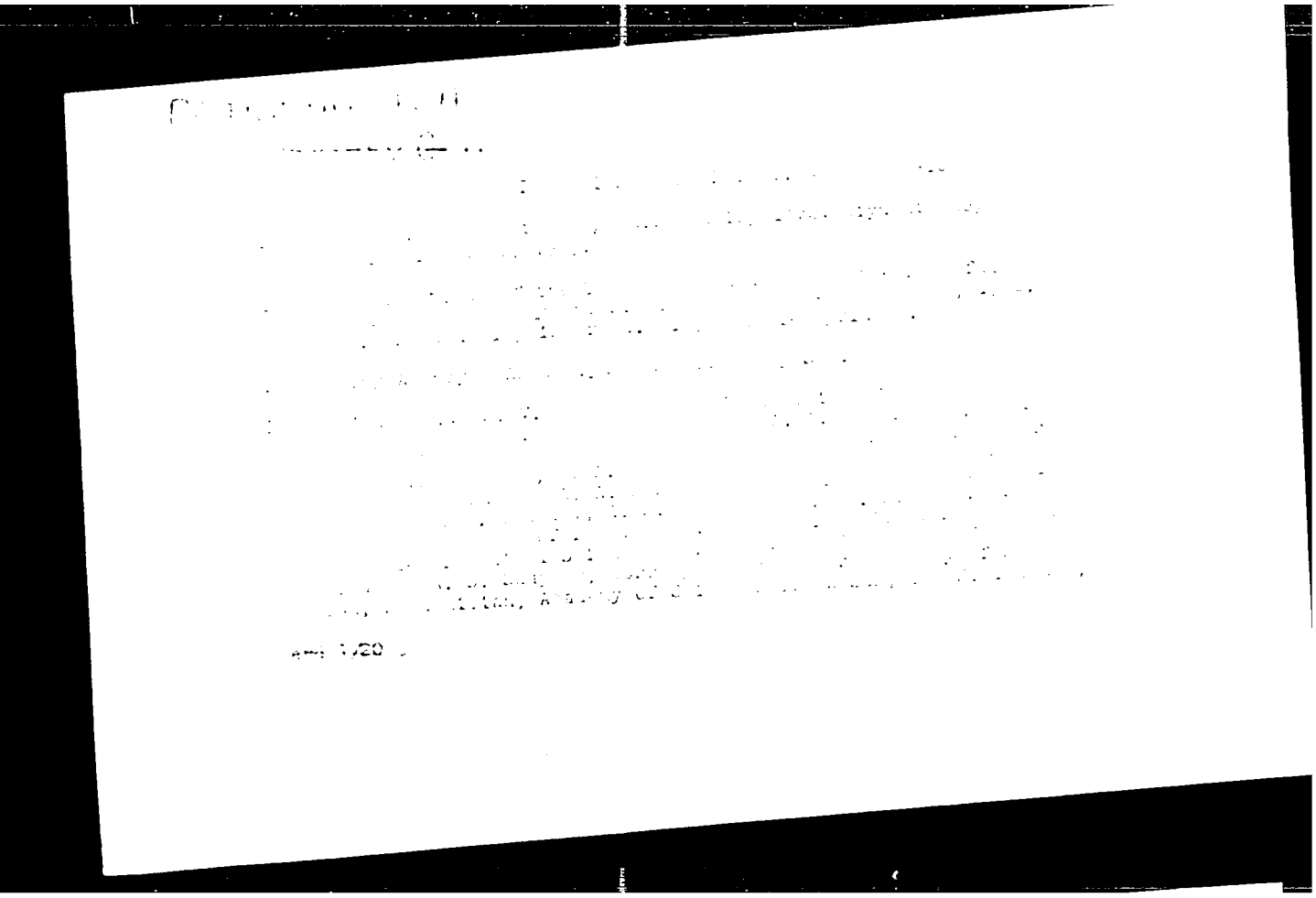
PRESENTED: April 8, 1959, by A. I. Ioffe, Academician

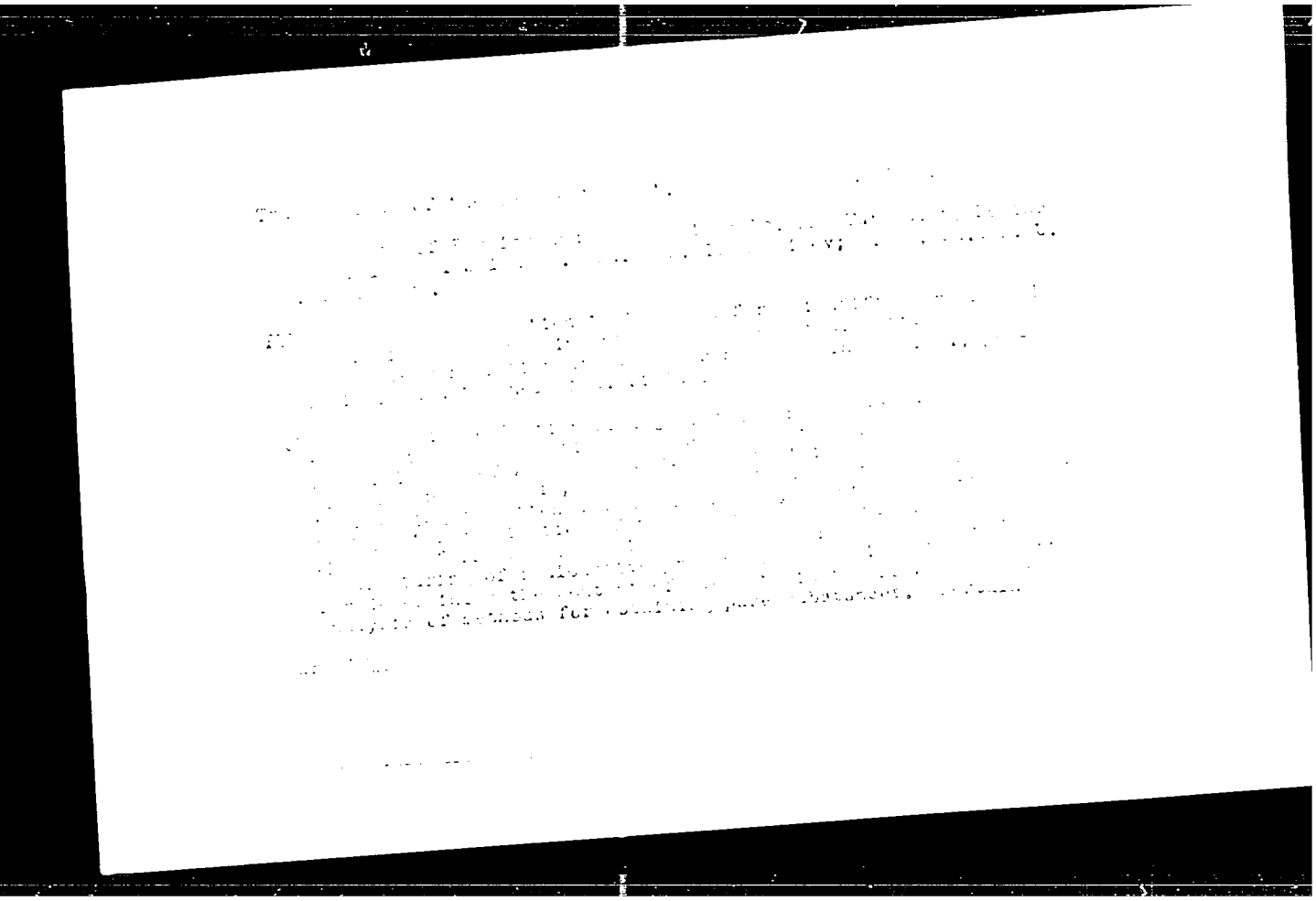
SUBMITTED: April 2, 1959

Card 4/4

PETRZHAK, K.A.; TOLMACHEV, G.M.; USHATSKIY, V.N.; BAK, M.A.; BLINOVA, N.I.; BUGORKOV, S.S.; MOSKAL'KOVA, E.A.; OSIPOVA, V.V.; PETROV, Yu.G.; SOROKINA, A.V.; CHERNYSHEVA, L.P.; SHIRYAYEVA, L.V.

[Yields of certain fragments in U^{235}, U^{238}, and Pu^{239} fission by neutrons] Vykhody nekotorykh oskolkov pri delenii U^{235}, U^{238} i Pu^{239} neitronami deleniia. Moskva, Glav. upr. po ispol'zovaniiu atomnoi energii, 1960. 14 p. (MIRA 17:2)





Translation of the Table of Contents (U.S.)

[illegible] articles are marked [illegible]. References follow individual articles.

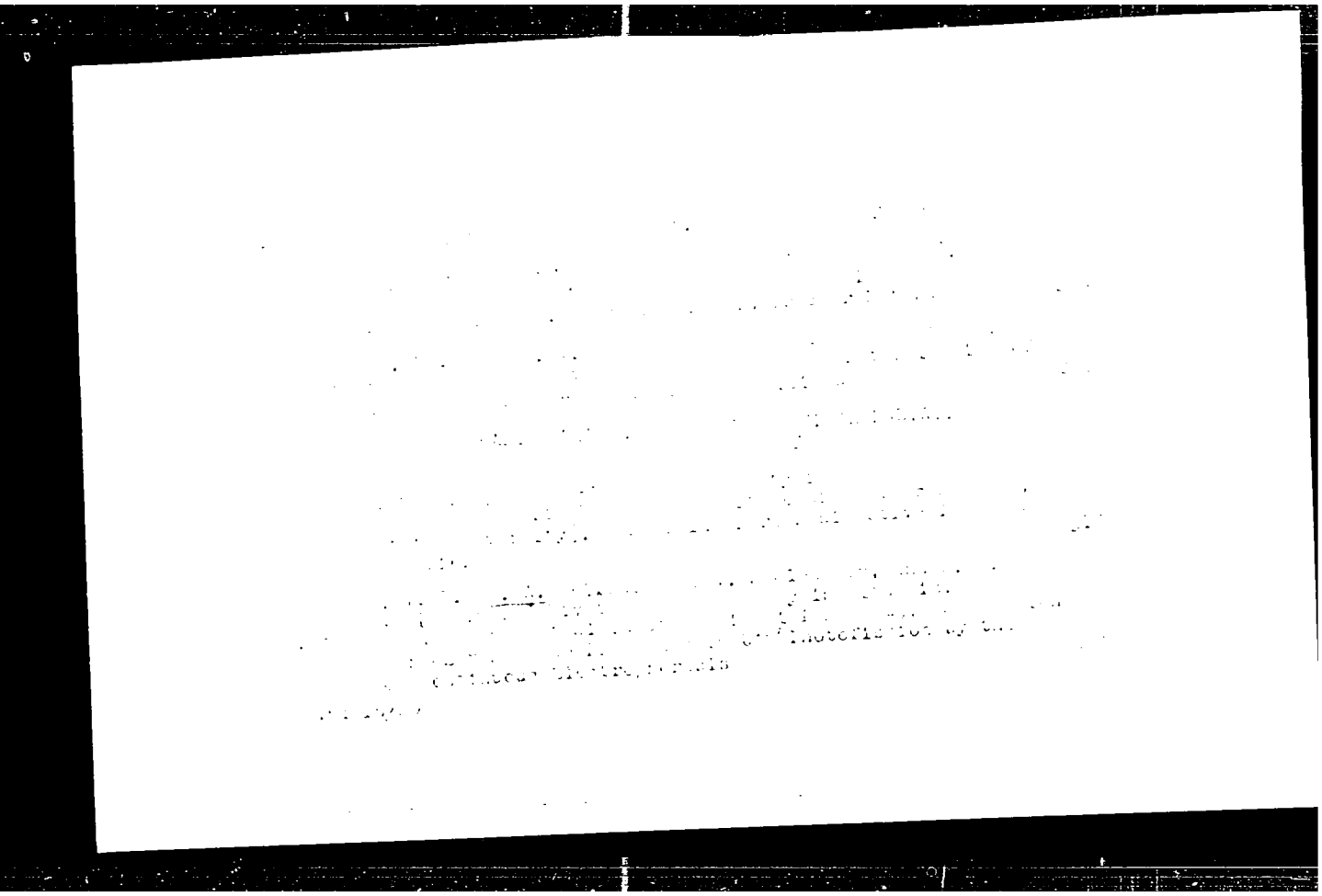
TABLE OF CONTENTS:

RADIOACTIVE [illegible] IN [illegible] AND GEOLOGY

[illegible], V. N. (Institute [illegible] Academy of Sciences USSR - Institute of Nuclear Physics Academy of Sciences Kazakh SSR). [illegible]tion of Radioactive Isotopes in the Process of Radiation in Ore Fields. 7

[illegible], I. V., and V. A. [illegible] (Institute [illegible] of Physics Academy of Sciences [illegible] Republic of Automatic-Control Apparatus). [illegible] Based on the Use of Radioactive Isotopes

[illegible] 3/20



82877

S/120/60/000/02/006/05-
E032/E414

24.6810

AUTHORS: Petrzhak, K.A. and Sedletskiy, R.V.

TITLE: Counters for Measuring Low Activities

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, Nr 2, pp 34-37 (USSR)

ABSTRACT: The description is given of three spherical flow 4π - counters made of stainless steel teflon and polyester resin and a spherical end-window flow counter made from teflon with a thin perchlorovinyl window. The counters have a background of 2 to 7 pulses/min and can be used in absolute and relative measurements on radioactive preparations giving rise to a few disintegrations per minute. The natural counter background normally consists of contributions due to cosmic rays radioactive elements in the surrounding objects and in the screen and traces of radioactive materials in the counter itself. The cosmic ray background was reduced by using an anticoincidence arrangement and by placing the counter at a considerable depth below ground. In order to reduce the background due to radioactive elements in the surrounding objects

Card 1/3

82877
S/120/60/000/02/008/052
E032/E414

Counters for Measuring Low Activities

a screen consisting of 2 cm lead, 15 cm steel and 1.6 cm brass was employed. The 4π - counters employed were of the form shown in Fig 1, while the end-window counters were of the form shown in Fig 2. They both employ circular anodes made of 40 μ tungsten wire, the loop diameter being 7 mm in the case of a 50 mm dia sphere and 4 mm in the case of a 30 mm dia sphere. The sphere of each counter is divided into two halves by a partition which carries the radioactive preparation. The end-window counters are very similar except that they are cut off along a cord so as to form a window. Technical methane or a mixture of methane and argon, in which methane serves as the quenching component, were used as the working gases. A detailed investigation was made of the dependence of the counting characteristics, i.e. the magnitude of the working potential, the length of the plateau and the plateau slope on the percentage concentration of methane, the diameter of the wire, the diameter of the loop, the position of the loop and the mechanical and heat treatment

Card 2/3

82877

S/120/60/000/02/006/03-
E032/E414

Counters for Measuring Low Activities

of the wire. The results obtained have been used to choose optimum conditions for the operation of the counters and are given in the table. There are 3 figures, 1 table and 10 references, 3 of which are Soviet and 7 English.

ASSOCIATION: Leningradskiy tekhnologicheskiy institut (Leningrad Technological Institute)

SUBMITTED: March 14, 1959

Card 3/3

S/081/61/000/022/003/076
B102/B108

AUTHORS: Shvedov, V. P., Petrzhak, K. A., Sedletskiy, R. V., Stepanov, A. V.

TITLE: Extraction of the rare-earth group from U^{238} photofission fragments by continuous electrophoresis

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 22, 1961, 36, abstract 22B248 (Tr. Tashkentsk. konferentsii po mirn. ispol'zovaniyu atomn. energii. Tashkent, AN UzSSR, v. 2, 1960, 325-326)

TEXT: Electrophoretic separation of rare-earth fission products is preceded by the extraction of their sum. Recipe: dissolve 1 g of irradiated U_3O_8 in 2 ml of concentrated HNO_3, add $Pb(NO_3)_2$ (20 mg with respect to Pb) and $Ce(NO_3)_3$ (15 mg with respect to Ce) as carriers to 15 ml HNO_3 (spec. wt. 1.5), and twice precipitate $Pb(NO_3)_2$ to remove the Ba and Sr isotopes. Isolate the precipitates, boil down the solution to 2 ml, dilute with water to 15 ml and precipitate CeF_3 after adding $Zr(NO_3)_4$

Card 1/3

carrier (20 mg with respect to Zr) and a mixture of HF and NH_4F. The precipitates are rinsed with water and dissolved in a mixture of H_3BO_3 and HNO_3. Then Ce^{3+} is oxidized to Ce^{4+} by bromate, 3 mg of Fe^{3+} are introduced into the solution, and $Ce(IO_3)_4$ is precipitated by means of 15-17 ml of an 0.35N HIO_3 solution. The solution containing Fe^{3+}, K, IO_3^-, BrO_3^-, and rare-earth elements (REE) is heated, and $Fe(OH)_3$ is precipitated by a solution of concentrated NH_4OH. The $Fe(OH)_3$ precipitates with the REE are rinsed with hot water and dissolved in 4 ml of concentrated HCl. After cooling the obtained solution, Fe^{3+} is removed by fourfold extraction with amyl acetate. The aqueous phase is evaporated, the dry remainder is calcined and treated with HNO_3 and 30% H_2O_2. After having removed the acids have been extracted by heating, dissolve the remainder in 0.7 ml of 0.01% Trilon B solution, Ce^{3+} (0.001 mg/ml) carrier introduced, and subject the obtained solution to electrophoresis in an 0.01% Trilon B solution (pH 1.94) as an electrolyte. Separation is to take place at a potential gradient of ~10 v/cm. The flow rate into the

Extraction of the rare-earth

S/081/61/[illegible]
B102 B108

cell of the mixture to be separated is 1.5 ml/hr. By this method $La^{141, 140}$, Pr^{145}, $Nd^{149, 147}$, $Pm^{140, 150}$, and $Y^{91, 93}$ have been extracted. The separation time of the total of REE was [illegible] hr, the time of electrophoresis was 2 hr 20 min. [Abstracter's note: Complete translation.]

Card 3/3

S/[illegible]
AC[illegible]

AUHTORS: Malkin, L. Z.; Nikol skaya, Ye. B , Petrzhak, K.A.

TITLE: Investigating the possibility of the existance of an α-branch of Ra^{225} in the neptune row

PERIODICAL: Radiokhimiya, v. 2, no. 5, 1960, 652

TEXT: The problem dealt with by the authors was the study of the α- decay of Ra^{225}, the possibility of which was predicted theoretically, (Ref. 1: W. Jentschke. Phys. Rev., 77, 4c, 1950). It is pointed out that till the present time no experimental attempt was made to detect the α-emission of Ra^{225}, decomposing by β-decay with a T = 14.8 days. It is mentioned that Ra^{225} is a member of the neptune row a part of which is given as being:

$U^{233} \rightarrow Th^{229} \rightarrow Ra^{225} \rightarrow Ac^{225} \rightarrow Fr^{221} \rightarrow At^{217}$

The limit obtained for the existance of an α-branch for Ra^{225} (Ref. 1:

Card 1/3

S/186-60/002/ ...
A051/A130

Investigating the possibility of

D. Strominger, J. M. Hollander, G. T. Seaborg, Rev. Modern Physics, ..., 806, 1958) is given as being ≤ 0.0 %. The authors had at their disposal a preparation of U^{233} (gr) of high radiochemical purity, kept for two years. The latter was used as the source of Ra^{225}. The difficulty of observing the weak α-activity of the Ra^{225} on a background of other α-emitters of the neptune row such as the Ac^{225}, Fr^{221}, At^{217}, etc. is pointed out. It is stated that with the alpha decay of Ra^{225} emanation Em^{221} should form. This known isotope of emanation is obtained usually in the reaction of splitting off from Th^{232} using fast protons. The half-life of Em^{221} is 25 m. 80 % of the emanation decays by beta-emission, forming Fr^{221} and 20 % by alpha emission, forming Po^{217}. Thus by detecting the presence of Em^{221} in the preparation the existance of alpha-decay of Ra^{225} was proven. In order to measure the Em^{221} a known method of emanation measurement of Rn^{222} was used (Ref. 3: Sbornik prakticheskikh rabot po radiokhimii pod redaktsiey I. E. Starika, A. N. Murina i A. P. Patnera. Izd. LGU, 19..). The solution of the U^{233} was placed into a bubbler which was sealed for three hours. It was later opened and the emanation was transferred to an ionization chamber, the ionization stream of which was measured on an СГ-1М (SG-1M) electrometer. According to the obtained measurements, the

Card 2/3

Investigating the possibility of .....

ionization current of the chamber did not exceed the background, i.e, Em^{221} was not detected in the U^{235}. An evaluation of the sensitivity of the method used showed that Em^{221} could be detected if the alpha-decay of the Ra^{225} exceeded 0.0001 % of its beta-decay. Thus, the obtained results lead to the establishment of a limit of α-branching of the Ra^{225} as < 0.0001 %, which corresponds to T_a > 50,000 years. There are 5 references: 1 Soviet-bloc, 2 non-Soviet-bloc. The English language publications read as follows: W. Jentscke, Phys. Rev., 77, 98, 1950; D. Strominger, J. M. Hollander, G. T. Seaborg, Rev. Modern Physic, 30, 2, 806, 1958).

Card 3/3

21089

21,4200

AUTHROS:

TITLE:

PERIODICAL:

TEXT:

Card 1/4

S/186/60/002/004/014/026
AC61/A129

The application of ...

(Sr*, Ba*) is precipitated by adding .5 ml of fuming HNO_3 (98 %) while cooled on ice for 15 minutes and mixing. The $Pr(NO_3)2$ solution is dissolved in 4 ml of H_2O and a second precipitation of $Pr(NO_3)_2$ is performed. The combined solutions containing the sum of the rare earth fragments LX_3, other separation fragments and $UO_2(NO_3)_2$ are evaporated to 2 ml. After mixing with water up to 15 ml, 20 mg of Zr-carrier are introduced into the solution and the precipitation of CeF_3 is carried out with a mixture of $HF-NH_4F$. After washing the fluorides with water they are dissolved in a mixture of H_3BO_3 and 6 ml of HNO_3. 2 gr of $KBrO_3$ is added to the obtained solution for satisfying Ce^{III} to Ce^{IV}, 3 mg Fe(III)-carrier is added and precipitation of $Ce(IO_3)_4(LX_3)$ is carried out with 15 - 17 ml of 0.35 n HIO_3, while cooling on ice and mixing for 10 minutes. The solution containing Fe(III), the sum of the rare earth fragments, K^+, IO_3^-, BrO_3^- is heated and a careful precipitation of $Fe(OH)_3$ is carried out with concentrated NH_4OH. The $Fe(OH)_3$ residue containing the rare earth elements is washed twice with hot water and dissolved in 4 ml of concentrated HCl, after which Fe(III) is removed with a four-fold extraction of the iron-chloride complex in amylacetate. The experimentally

Card 2/4

The application of continuous .....

determined yield of the rare earth fragments was found to be 60 %. The time required for the radiochemical separation of the rare earth fragments without a carrier was 2.5 hours. The addition of Fe(III) before the precipitation of $Ce(IO_3)$ reduced the losses. The possibility of using the extraction of iron diethylcarbamate into ether from 0.1 n HCl for removal of the iron in the last stages was investigated and was found to be unsuitable, since products of the thermal decomposition of diethyldithiocarbamate remained behind. The electrophoretic separation of the rare earth sum fragments and the apparatus used for the procedure shown in Figure 1 are described. The apparatus is being reconstructed at present in order to decrease the time of the separation of the sum of the rare earth fragments. The final yield of the rare earth fragments without a carrier in radiochemical and subsequent electrophoretic separation was determined by means of Y^{90} (T = 64.3 hours), Pm^{147} (T= 2.65 years) and $Eu^{152,154}$ (T = 16 years), and was found to be about 45 - 50 %. There are 3 figures and 8 references: 7 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English language publication reads as follows: K. E. Ballou, Radiochemical Studies: The Fission Product, 9, 3, 306, 1951.

SUBMITTED: July 6, 1959.

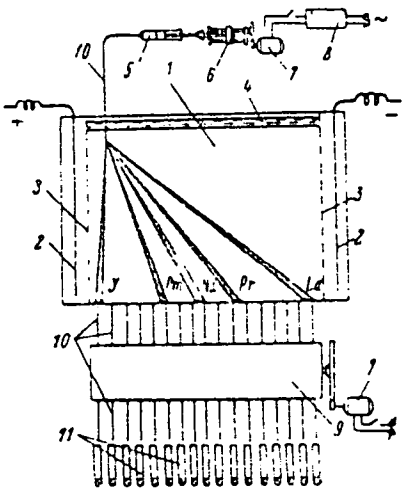
Card 3/4

24089

S/186/60/002/006/014/025
A051/A129

The application of continuous ....

Figure 1: Diagram of the apparatus for conducting continuous electrophoresis. 1 - electrophoretic chamber, 2,- platinum electrodes, 3 - semipermeable membranes, 4 - electrolyte, 5 - syringe, 6 - device for pushing out the syringe, 7 - synchronous motors, 8 - RC-generator for feeding the synchronous motor, 9 - pump of peristaltic action, 10 - polyethylene tubes, 11 - test tubes for collecting the fractions.



Card 4/4

85583

S/048/60/024/007/015/032/XX
B019/B056

24.6600
AUTHORS: Bak, M. A., Petrzhak, K. A., and Chen' Tya-mey

TITLE: The (n, 2n) and (γ, n) Reactions of Au^{197} 19 79

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya. 1960. Vol. 24, No. 7, pp. 818-819

TEXT: This paper was read at the 10th All-Union Conference on Nuclear Spectroscopy, which took place from January 19 to January 27, 1960 at Moscow. The (n, 2n) and (γ, n) reactions transform one and the same initial nucleus into one and the same nearest light isotope of the bombarded nucleus. The authors investigated the interaction of 14-Mev neutrons with Au^{197} and the interaction of γ-quanta, whose upper energy limit was also 14 Mev, with Au^{197}. For the (n, 2n) reaction an effective cross section of (1800±500) mb, and for the (γ, n)-reaction at hν = 17.5 Mev one of (460±50) mb was obtained. In these reactions, the Au^{196} isotope was obtained from the Au^{197} isotope. In the experiments described here, the 14 Mev neutrons were obtained from the reaction $H^3(d,n)He^4$; the cor-

Card 1/2

DMITRIYEV, V.N.; DRAPCHINSKIY, L.V.; PETRZHAK, K.A.; ROMANOV, Yu.V.

Comparing the probabilities of triple fission of U^{233}, U^{235} and Pu^{239}. Zhur.eksp.i teor.fiz. 38 no.3:998-999 Mr '60. (MIRA 13:7)

1. Radiyevyy institut Akademii nauk SSSR.
(Nuclear fission) (Uranium--Isotopes)
(Plutonium--Isotopes)

85680

S/056/60/038/006/022/049/XX
B006/B070

26.2211

AUTHORS: Petrzhak, K. A., Petrov, Yu. G., Shlyamin, E. A.

TITLE: Range and Kinetic Energy Dispersion of U^{233} Fission Fragments

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960
Vol. 38, No. 6, pp. 1723-1728

TEXT: The range distribution of the following U^{233} fission fragments in different gases was investigated: Sr^{91-92}, Y^{92-93}, Zr^{97}, Ba^{140}, and Ce^{144}. The uranium target was placed in a hermetically sealed aluminum cylinder. The container had 30 films each ~6 μg/cm² thick and separated from each other by 2.5 mm. The distance between the target and the first film was 136 mm. The container was filled with various gases (hydrogen, helium, nitrogen, air, neon, and argon). The thicknesses of the U^{233} target were 76, 110, 145, 228, and 284 μg/cm². The container was irradiated at constant temperature for ~2 hours on the reactor of the AS USSR in a flux of 10^{12} n/cm²sec. After the irradiation, the activity of each film was measured with an end-window beta counter. Sr, Y, Zr, Ba, and Ce were

Card 1/4

85680

Range and Kinetic Energy Dispersion of [illegible] S/076/63/037/006/[illegible]/XX
Fission Fragments B006/B070

separated by the usual method of chemical analysis. The range distribution curves of the above-mentioned fission fragments in the various gases were obtained from the results of the radiochemical analysis; the average values of the range and the range dispersion were determined therefrom. For illustration, Fig. 3 shows the range distribution curve of the Ba^{140} nucleus in H_2. The ordinate gives the relative activity of Ba^{140} in the various films, while the abscissa gives the fragment range at p_{H_2} = 760 mm Hg and t = 15°C. The experimental distribution falls nearly on a Gaussian curve. Analogous results were obtained for the other fragments and gases. The scattering of the fragment ranges is assumed to be due to energy fluctuations of fragments caused by nuclear deformations, changes in kinetic energy as a result of fluctuation of the initial charge of the nucleus during fragment emission, statistical fluctuations of the electron number and the number of nuclear collisions during the slowing down of fragments in the gas, change of kinetic energy on emission of a neutron from a fragment, slowing down in the target material and, finally, to the geometry of the apparatus. A formula is given for determining the scattering S of the ranges. The

Card 2/4

85680

S/056/60/038/006/022/049/XX
B006/B070

Газ Gas	Sr^{91-90}		Y^{90-90}		Zr^{97}		Ba^{140}		Ce^{144}	
	R. см	S. %	R. см	S. %	R. см	S. %	R. см	S. %	R. см	S. %
Водород H_2	10,05	7,37	10,05	6,66	9,61	7,92	7,58	6,13	7,68	5,12
Гелий He	15,75	7,09	15,68	6,84	15,61	6,99	11,93	7,03	12,02	5,86
Азот N_2	2,58	9,51	2,52	9,41	2,50	10,27	—	—	1,86	9,26
Воздух Air	2,54	8,04	2,51	7,61	2,44	8,20	1,85	9,87	1,84	8,71
Неон Ne	4,80	9,86	4,84	8,69	4,66	9,60	—	—	—	—
Аргон Ar	2,60	10,59	2,58	9,88	2,49	9,38	1,85	11,38	1,81	10,31

Card 4/4

83760

S/056/60/039/003/001/045
B004/B060

24.6600 (1138)

AUTHORS: Dmitriyev, V. N., Drapchinskiy, L. V., Petrzhak, K. A., Romanov, Yu. F.

TITLE: Energy Distribution of Fragments of Triple Fission of U^{233} 19

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 3 (9), pp. 556-562

TEXT. The authors wanted to obtain more accurate data regarding the energy distribution mentioned in the title by recording the energy of pair fragments. The alpha particles on either side of the target of the fissile substance were recorded in order to exclude the effect of angular correlation of fragments and alpha particles. Fig. 1 shows the arrangement of electrodes in the triple ionization chamber. The latter was filled with argon, whose 2 atm pressure prevented the alpha particles of the natural uranium radioactivity from penetrating into the chamber. Long-range alpha particles with energies from 10 to 24 Mev were recorded in the chamber. The target of the fissile substance was applied

Card 1/4

Energy Distribution of Fragments of Triple Fission of U^{235}

S/056/60/039/003/005/049
B004/B060

onto the common electrode of the fission chambers. The U^{235} was sprinkled onto one side of a gold-coated polyvinyl chloride acetate film in the electrostatic field. The U^{235} layer applied was 10 microgram/cm² thick. Fig. 2 shows the block diagram of the electronics the operation of which is described. The experiments were made on the physical reactor belonging to the AS USSR. 6000 triple fission events and 6000 double fission events were recorded. Fig. 3 shows the spectra relating to the fragments of triple and double fission taking account of the ionization caused by long-range alpha particles. The peak of light fragments is shifted in the direction of low energies by (9.0±0.5) Mev in the case of triple fission, while the peak of heavy fragments is shifted by (6.0±0.5) Mev. Fig. 4 shows the fragment yield in triple and double fission as a function of the total energy of fragments. The difference between the most probable energies amounts to (15.0±0.5) Mev. The half-width of distribution of triple fission fragments is 7 Mev smaller than in the case of double fission. The distribution approaches the form of a Gaussian. The fragment yield was determined as a function of the mass ratio on the strength of experimental data (Fig. 5). Fig. 6 shows the most probable

Card 2/4

Energy Distribution of Fragments of Triple Fission of U^{235}

S/056/60/039/003/005/043
B004/B060

energies and dispersions of the kinetic total energy of fragments as a function of the mass ratio. The peaks observed in the range of mass ratio 1.3 are explained by the effect of the shell structure in accordance with A. N. Protopopov and I. A. Baranov (Ref. 10). The authors arrive at the conclusion that the probability of triple and double fission is not dependent on the mass ratio. The relation $E_{db} = E_{tr} + E_{\alpha}$ (1) holds, where E_{db}, E_{tr} denote the kinetic total energy of double and triple fission fragments and E_{α} the energy of alpha particles. The following relations are written down for the most probable event. E_{db} = 166.4 Mev $E_{tr} + E_{\alpha}$ = 151.4 + 14.8 = 166.2 Mev. The half-width values ΔE_{db}, ΔE_{tr}, ΔE_{α} obey equation $(\Delta E_{db})^2 = (\Delta E_{tr})^2 + (\Delta E_{\alpha})^2$, and are in agreement with experimental data. An explanation is supplied for the mechanism of triple fission. The authors mention papers by K. A. Petrzhak, Yu. F. Romanov, and T. I. Solov'yeva (Ref. 1), and V. I. Mostovoy et al. (Ref. 4). They thank M. A. Bak and S. S. Kovalenko for their advice and discussions, E. A.

Card 3/4

83760

Energy Distribution of Fragments of Triple Fission of U^{235}

S/056/60/039/003/009/045
B004/B060

Gavrilov and A. P. Shilov for their cooperation in experiments made on the physical reactor of the AS USSR. There are 6 figures and 18 references. 9 Soviet, 6 US, 1 British, 1 Canadian, and 1 French.

ASSOCIATION: Radiyevyy institut akademii nauk SSSR (Radium Institute of the Academy of Sciences USSR)

SUBMITTED: April 14, 1960

Card 4/4

298e

S/641/61/000/[illegible]/[illegible]
B104/B102

24660C

AUTHORS Petrzhak, K. A., Tolmachev, G. M., Ushatskiy, V. N., [illegible], M. A., Blinova, N. I., Bugorkov, S. S., Moskal[illegible], E. Osipova, V. B., Petrov, Yu. G., Sorokina, A. V., Chernysheva, L. F., Shiryayeva, L. B.

TITLE Yields of some fragments in the fission of U^{235}, U^{238}, and Pu^{239} by fission neutrons

SOURCE Krupchitskiy, P. A., ed. Neytronnaya fizika; sbornik st[illegible]. Moscow, 1961, 217-223

TEXT The authors determined the yield of Sr^{89}, Zr^{95}, Mo^{99}, $Ag^{[illegible]}$, [illegible], and Ba^{140} in the fission of U^{235}, U^{238}, and Pu^{239} by fission neutrons. A U^{235}-enriched uranium plate arranged in the thermal column of a heavy water reactor of the AS USSR served as neutron source. 300-mg tablets and [illegible] targets were produced from each substance to be fissioned. The fission events were recorded in a fission chamber during the entire irradiation period (Fig. 1). The fission fragment yields were determined from their

Card 1/[illegible]

S/641/61/000/[illegible]
3104/B102

Yields of some fragments ...

β-activity. The absolute β-activity was measured by two standard instruments with end-window counters. These standard instruments were calibrated with preparations of the fission fragments to be studied which had been applied to a collodium film. The absolute β-activity of the standard preparations was determined either with a 4π-counter or with an end-window counter having a window thickness of 0.005 ± 0.001 [illegible] ... eight measurements were made in three to four tablets. [illegible] The determination error of the fragment yield was between [illegible] and [illegible]. The fragment yield is found to depend on the isotope mass number. [illegible] figures, [illegible] tables and 7 references: [illegible] Soviet and 4 non-Soviet. The four references to English-language publications read as follows: Englkemeir [illegible] Sugarman N. Radiochemical Studies [illegible] Fission Products, Book [illegible] div. IV, vol. [illegible] Appendix [illegible]. Keller R., Steinberg E., Glendenin L. Phys. Rev. 94, [illegible]. [illegible] Kevich A., Niday J. Phys. Rev. 84, [illegible]

Card [illegible]

S/081/62/000/004/002/087
B149/B101

AUTHORS: Vasil'yev, I. A., Petrzhak, K. A.

TITLE: Some regularities in mass spectra of heavy nuclei fission products

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 4, 1962, 41, abstract 4B268 (Tr. Leningr. tekhnol. in-ta im. Lensoveta, no. 55, 1961, 5 - 22)

TEXT: The locations of the maxima of distribution curve (DC) for fission fragments according to the mass number A, have been calculated on the Swiatecki empirical formula (RZhFiz., 1956, no. 9, 25009). Good agreement was obtained with the authors' experiment on photofission of Th^{232} and with literature data on photofission of U^{235}, U^{238} and on spontaneous decay of U^{238}, Cm^{242}, Cf^{252}. With the increase in excitation energy E of the intermediate nucleus a tendency toward more symmetrical fission is observed. The location of the peak among heavy fragments is nearly independent of the A_f for the nucleus undergoing fission, but among the light fragments it

Card 1/3

Some regularities in ...

changes considerably. This fits Hill's theory (RZhFiz., 1956, no. 3, 6398) according to which the outer nuclear shells are subjected to symmetrical fission, and with increased E, deeper nuclear shells become involved. On the strength of the experimental data regarding the shape of the DC it is deduced that with the increase in A_f and E, the half-width of the peaks grows, and the yield maximum drops. The narrowest peaks are observed in the case of spontaneous decay and fission by low-energy photons. The "fine structure" of the DC is explained by the influence of closed nuclear shells consisting of 82 neutrons or 50 protons; this is confirmed by agreement of the experimental maxima of "fine structure" with the authors' calculations. The calculations for the DC have been made following Fong's method (RzhKhim., 1957, no. 7, 21916), as applied to photofission of Th^{232} and U^{238}. The calculations are in good agreement with experimental results as regards curve shape and location of maxima. On the basis of their calculations, authors believe that the narrowest and highest peaks of DC would be observed in Th^{230} photofission products. They show that the ratio between the yields of the most probable and the most symmetrical types of fission depends not only upon E, but also upon the nucleus undergoing

Card 2/3

33062
S/058/6[illegible]
A058/A1[illegible]

21.2110

AUTHORS: Kovrigin, B.S., Petrzhak, K.A

TITLE: Production of thin free films containing uranium or [illegible]

PERIODICAL: Referativnyy zhurnal. Fizika, no. 12, 1961, 74, abstract [illegible]
Leningr. tekhnol. in-ta im. Lensoveta, 1961, no. 95 [illegible]

TEXT: There was worked out a technique for producing [illegible] taining uranium or thorium by cathode spraying a cellulose nitrate ca[illegible] its subsequent dissolution. More than 20 films were prepared, each wi[illegible] density 0.1-0.2 mg/cm^2 and working area 60 cm^2. The uranium films [illegible] U_3O_8, and the thorium films contained 40% thorium and ThO_2. Compari[illegible] particle spectra and uranium fission fragments from both sides of films s[illegible] that impurities (organic matter and moisture) are distributed throughout [illegible] thickness and that the backing side has a residual layer with surface [illegible] 0.01 mg/cm^2.

[Abstracter's note: Complete translation]

X

Card 1/1

PETRZHAK, K.A.; SEDLETSKIY, R.V.

The 4-π counter for measuring low-level radioactivity. Prib.i tekh.eksp. 6 no.5:177-178 S-O '61. (MIRA 14:10)

1. Leningradskiy tekhnologicheskiy institut.
(Nuclear counters)

S/089/61/011/006/008/014
B102/B138

21405

21.1000

AUTHORS: Shpakov, V. I., Petrzhak, K. A., Bak, M. A., Kovalenko, S. S., Kostochkin, O. I.

TITLE: Delayed-neutron yields in Pu^{239} and Th^{232} fissions induced by 14.5-Mev neutrons

PERIODICAL: Atomnaya energiya, v. 11, no. 6, 1961, 539 - 540

TEXT: From theoretical considerations and analyses of experimental data a slight decrease in delayed-neutron yields is expected with increasing excitation energy. So far it has only been measured for 14.5 Mev thermal fission neutrons from U^{235}. The authors measured the delayed-neutron yield of 14.5-Mev neutron-induced Pu^{239} fission and, for comparison, that of Th^{232} fission. It was determined as the ratio between number of fission events and the number of delayed neutrons produced per second in the sample of fissile matter. The Pu or Th sample was cadmium coated and bombarded with 14.5-Mev neutrons from $T(d,n)He^4$ reactions, with a target just behind it being irradiated simultaneously. The steel backing of the target was one electrode of the ionization chamber. To measure

Card 1/3

Delayed-neutron yields in...

S/089/61/011/006/006/014
B102/B138

the number of delayed neutrons emitted, about 0.2 sec; after irradiation had ceased the sample was dipped into a neutron detector 1.5 m from the neutron source. The detector consisted of 17 boron counters of the CHM-5A (SNM-5A) type contained in a paraffin block. The end of neutron bombardment which coincided with removal of the sample was established cinematographically with an accuracy of 0.02 sec. As neutron counting started 0.2 sec after the end of bombardment, this caused a loss in neutrons with a delay of 0.1 sec. Special measurements were made to determine this error, which was not above the experimental level. The total number of delayed neutrons could thus be determined by extrapolating the neutron number - versus - time curve to the instant when bombardment ceased. The following results were found: total delayed-neutron yield per decay event: 0.0130 ± 0.0015 for Pu^{239}, and 0.075 ± 0.007 for Th^{232}. The Pu^{239}, yield is twice as high as when fission is induced by thermal or fission neutrons. This result is explained by assuming that neutron emission probability increases with increasing excitation energy. There are 1 figure and 4 references: 3 Soviet and 1 non-Soviet. The two references to English-language publications read as follows: G. Keepin et al., Phys. Rev 107, 1044 (1957); J. Nucl. Energy, 6, 1 (1957); K Sun et al., Phys Rev 79, 3, 1950.

Card 2/3

Delayed-neutron yields in.

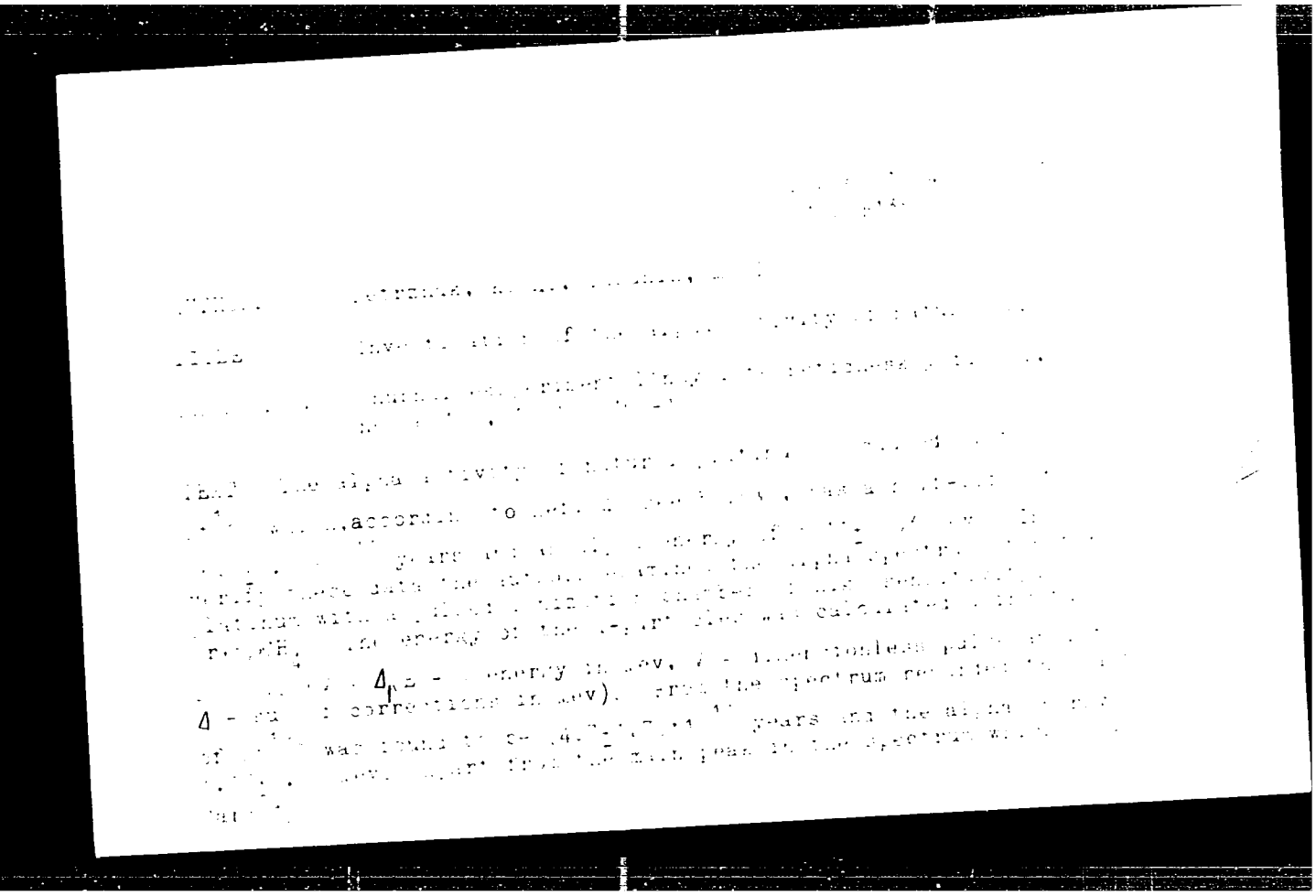
SUBMITTED: July 18, 1961

21405
S/089/61/011/006/008/012
B102/B138

Card 3/3

GRAUDYNYA, L.Ya.; PETRZHAK, K.A.; SOROKINA, A.V.

Gamma rays produced in inelastic scattering of 2.95 Mev. neutrons on J^{127}, La^{139}, and B^{209}. Izv.AN SSSR.Ser.fiz. 25 no.10:1283-1285 O '61. (MIRA 14:10)
(Neutrons—Scattering) (Gamma rays—Spectra)



PETRZHAK, K.A.; FLEROV, G.N.

Spontaneous fission of atomic relief nuclei. Usp. fiz. nauk 73 no.4:655-683 Ap '61. (MIRA 14:4)
(Nuclear fission)

34348
S/197/62/000/001/001/002
B117/B104

24.6500

AUTHORS: Graudynya, L., Kostochkin, O., Petrzhak, K. Sorokina A.

TITLE: γ-rays in inelastic scattering of 2.95 Mev neutrons from Al^{27}

PERIODICAL: Akademiya nauk Latviyskoy SSR. Izvestiya, no. 1 (174), 1962, 51-52

TEXT: The authors studied γ-transitions of Al^{27} with the aid of the spectra of the γ-rays forming in inelastic scattering of 2.95-Mev neutrons. The studies were made with a scintillation spectrometer, the experimental conditions were the same as in Ref. 1 (V. M. Adamov, L. Ya. Graudynya K. A. Petrzhak, A. V. Sorokina, Izv. AN Latv. SSR, no. 5, 1961). The weight of the circular Al-scatterer was 333 g. The neutrons scattered by the Al-scatterer into the crystal interact with the NaI(Tl) crystal and bring about a γ-background. The background γ-ray spectrum was measured with an organic-glass scatterer. The number of scattering atoms was the same in aluminum and organic glass. Besides the already known γ-lines with 0.84, 1.02, and 2.25 Mev an additional line with 2.82 Mev was

Card 1/2

S/120/62/000/001/020/061
E140/E463

AUTHORS: Dmitriyev, V.N., Drapchinskiy, L.V., Petrzhak, K.A., Romanov, Yu.F.

TITLE: Measurement of conjugate fission fragment energies

PERIODICAL: Pribory i tekhnika eksperimenta, no.1, 1962, 64-66

TEXT: In studying energy evolution in the fission of heavy nuclei, the energies of the fission fragments must be measured. The authors use a method of photographic recording from the screen of a CRT, where the two axes correspond to the energies of two conjugate fission fragments. Up to 80 events are photographed on one frame, from which they are transferred to millimetric paper manually (using a projection technique). Ten thousand points can be plotted in 8 man hours. A control experiment was run to test the symmetry of the two channels, which was found satisfactory to within experimental error. There are 2 figures.

ASSOCIATION: Radiyevyy institut AN SSSR
(Radium Institute AS USSR)

SUBMITTED: June 7, 1961

Card 1/1

31:27
S/186/62/004/001/007/008
E075/E436

21,4200

AUTHORS: Sedletskiy, R.V., Petrzhak, K.A.

TITLE: Isolation of the group of rare earth fission fragments from uranium and thorium without a carrier

PERIODICAL: Radiokhimiya, v.4, no 1, 1962, 99-102

TEXT: The authors investigated the isolation of the group of rare earth fission fragments with small half-life periods from U and Th without an isotopic carrier. The method of isolation for U was as follows: a sample of irradiated U_3O_8 was dissolved in concentrated HNO_3. Th purified from the admixtures of $MsTh_2$ and $MsTh_1$ was used as the nonisotopic carrier in the form of ThF_4. The precipitated ThF_4 containing the rare earth elements was converted into thorium chlorate. Thorium from the chlorate solution was precipitated with HIO_3 as $Th(IO_3)_4$ and was rejected. The remaining solution contained the rare earth elements, which were separated either by an ion-exchanger or by the method of continuous electrophoresis. The yield of the rare earth elements as exemplified by Ce^{144} and Pm^{147} reaches 80 to 90%. The work showed that radioactive isotopes of Ba, Sr and Ra may precipitate

S/186/62/004/001/006/006
E075/E436

Isolation of the group

uranium and reached 50 to 60%. The methods described at [illegible] used for the investigation of yields of the rare earth fragments of photofission of U^{238} and Th^{232} with short half life periods without application of isotopic carriers such as Ce^{143} La^{141} Pr^{145} $Nd^{147, 149}$ $Pm^{149, 151}$ and Y^{93}.

SUBMITTED June 23 1960

Card 3/3

S/089/62/013/005/006/012
B102/B104

24,6610

AUTHORS: Kovalenko, S. S., Petrzhak, K. A., Adamov, V. M.

TITLE: The dependence of the total kinetic energy of fission fragments on the energy of the bombarding neutrons

PERIODICAL: Atomnaya energiya, v. 13, no. 5, 1962, 474-475

TEXT: K. A. Petrzhak has found (Zh. eksperim. i teor. fiz., 42, no. 6, 1475, 1962)* that in symmetric U^{238} fisson by 14.5-Mev neutrons the total kinetic energy of the fragments is by 15±2 Mev lower than when a fragment mass ratio of 1.3 is assumed. If this result is compared with results obtained by other authors for thermal fission of U^{235} and Pu^{239} it can be concluded that the fragment kinetic energy E_k grows with E_n in the region of symmetric fission. In order to verify this conclusion E_k was measured with U^{235} fission induced by thermal and 14.5-Mev neutrons. The results (Figure) agree well with those of other authors except in the symmetry region, where the total fragment energy was found to be smaller by 5-7 Mev than that found by Milton and Fraser (Phys. Rev. Lett.,

Card 1/3 * S/056/62/042/[illegible]/[illegible]

7, 67, 1961). For symmetric fission the fragment kinetic energy was by 25±5 Mev higher for 14.5-Mev neutrons than for thermal ones. The relation between the changes in symmetric fragment yield and in total kinetic energy agrees with the assumption that symmetric fission occurs below the Coulomb barrier. For symmetric fission the relation $E_1=E_2-10.5$ Mev was found to hold; E_1 is the fragment excitation energy for 14.5-Mev neutrons, E_2 that for thermal neutrons. These results indicate that symmetric and asymmetric fissions are two different kinds of fission. There is 1 figure.

SUBMITTED: April 17, 1962

Figure. $E_K=f(M_1/M_2)$ for U^{235} fission induced by thermal neutrons (a) and 14.5-Mev neutrons (b).

S/056/62/042/002/[illegible]/[illegible]
B102/B138

24 6400

AUTHORS: Graudynya, L. Ya., Kostochkin, [illegible]. I., Petrov[illegible], [illegible]., Sorokina, A. V.

TITLE: Gamma rays produced in inelastic scattering of 2.95-Mev neutrons on Ta^{181} nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 2, 1962, 349 - 352

TEXT: With the experimental arrangement shown in Fig. 1 the excitation spectrum was measured with a scintillation gamma spectrometer in annular geometry. Its resolution for the 0.66-Mev gamma lines of Cs^{137} was 10%. The soft spectrum up to 1 Mev was measured using a 286 g metallic Ta ring as scatterer; for the hard spectrum an annular container of organic glass was used, filled with 818 g Ta powder. The measurements were made in the [illegible]-3 Mev. The following gamma peaks were observed: 0.35, 0.43, [illegible].57, 0.62, 0.76, 0.86, 1.24, 1.47, 1.90 and 2.11 Mev. The peaks at 1.60 Mev are attributed to pair production in the NaI(Tl) crystal [illegible]nd 2.11-Mev gamma quanta. There was no 0.958-Mev level, but all

S/056/62/042/002/006/055
B102/B138

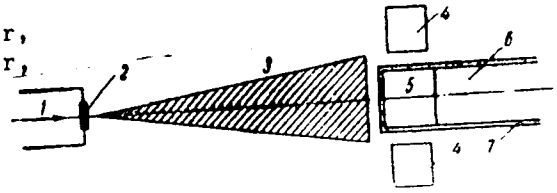
Gamma rays produced in inelastic...

the gamma transitions observed can be obtained without introducing this level. There are 2 figures, 1 table, and 8 references: 2 Soviet and 6 non-Soviet. The four most recent references to English-language publications read as follows: A. H. Muir, F. Boehm. Phys. Rev. 122, 1564, 1961; F. Boehm, P. Marmier. Phys. Rev., 103, 342, 1956; R. Day. Phys. Rev. 102, 767, 1956; B. Guernsay, A. Wattenberg. Phys. Rev. 101, 1516, 1956.

ASSOCIATION: Radiyevyy institut Akademii nauk SSSR (Radium Institute of the Academy of Sciences USSR)

SUPMITTED: July 17, 1961

Legend to Fig. 1: (1) Deuteron beam; (2) deuterium target, (3) lead shielding cone, (4) annular Ta scatterer, (5) NaI(Tl) crystal, (6) photomultiplier, (7) screen of black paper.



Card 2/2

38957

S/056/62/042/006/009/047
B104/B102

14.6600 (2506)

AUTHORS: Adamov, V. M., Kovalenko, S. S., Petrzhak, K. A.

TITLE: The kinetic energy of fragments from the fission of U^{238} by 14.5-Mev neutrons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 6, 1962, 1475 - 1477

TEXT: The total kinetic energy of fragment pairs from the fission of U^{238} by 14.5 Mev neutrons was investigated with the help of a double ionization chamber for mass ratios 1, 1.1, 1.2, 1.3, 1.43, and 1.56 of the pairs. The impulse coming from the fragment pairs was amplified and fed to the vertical and horizontal plates of a cathode ray oscillograph. This made it possible to determine the energy ratios and thence also the mass ratios ($E_1/E_2 = M_2/M_1$). $3 \cdot 10^6$ fission events were recorded. The most probable total kinetic energy as a function of the mass of the heavy fragment was obtained from the maxima of the spectra of the total kinetic energy for different mass ratios. These curves are very similar to those

Card 1/2

L 11137-63 EPF(n)-2/EWT(m)/BDS--AFFTC/ASD/SSD--Pu-4--DM
ACCESSION NR: AP3002264 S/0089/63/014/006/0574/0575

AUTHOR: Dmitriyev, V. N.; Drapchinskiy, L. V.; Petrzhak, K. A.; Romanov, Yu. F.

TITLE: Comparative characteristics of triple fission of uranium and plutonium

SOURCE: Atomnaya energiya, v. 14, no. 6, 1963, 574-575

TOPIC TAGS: triple fission, uranium, plutonium

ABSTRACT: The purpose of the work was obtaining sufficient data concerning the energy distribution of fission fragments of U sup 238, U sup 235, and Pu sup 239 by slow neutrons. Twenty thousand events of triple fission of the first, 15,000 events of the second, and 12,000 of the third nucleus were recorded. The apparatus used was described in Zhurn. eksper. i teoret. fiz., v. 39, 1960, 556. The data are plotted with E sub 1/E sub 2 as abscissa, E sub 1 + E sub 2 as ordinate, for each value of the relative frequency of fission; thus, the "contour diagram" is obtained. The diagrams are similar for all three nuclei. Figure 1 (see Enclosures) shows the results for U sup 238. The solid lines are for triple fission, and the broken lines are for double fission. Discussion of the result is presented. The latter indicate the same nature of fissions in all three nuclei. Orig. art. has: 2 figures and 1 table.

Card 1/4

L 11938-63 EWT(m)/BDS AFFTC/ASD IM

ACCESSION NR: AP3003968 S/0089/63/015/001/0006/0011

55

AUTHORS: Dmitriyev, V. D.; Petrzhak, K. A.; Romanov, Yu. F.

19

TITLE: Kinetic energy of fragments and Alpha-particle in triple fission of U sup 235.

SOURCE: Atomnaya energiya, v. 15, no. 1, 1963, 6-11

TOPIC TAGS: triple fission, U sup 235, energy of fission fragments

ABSTRACT: The connection between the kinetic energy of fragments and the energy of the long-range Alpha particles in a triple fission is essential in the theory of the latter. In the present work, the authors measured the energy distribution of the fragments of triple fission, the average energy of Alpha particles being 10.6, 16.4, 20.3, and 24.0 mev. It was found that the total average energy of the fragments does not depend on the Alpha particle energy when the latter is greater than 15 mev; it does depend on it for less energetic Alphas. The work was performed by using the reactor of the Leningrad Physico-Technical Institute, AN SSSR. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 23Aug63 DATE ACQ: 08Aug63 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 001

Card 1/1

L 17564-63 EWT(m)/BDS AFFTC/ASD IJP

ACCESSION NR: AP3005225 S/0089/63/015/002/0157/0158

AUTHORS: Petrzhak, K. A.; Komrat'ko, M. Ya.; Nikotin, O. P.; Teplykh, V. F.

TITLE: Delayed neutrons from photofission of U sup 238

SOURCE: Atomnaya energiya, v. 15, no. 2, 1963, 157-158

TOPIC TAGS: U sup 238, delayed neutron, photofission of U sup 238, bremsstrahlung, betatron

ABSTRACT: The authors described in previous papers an apparatus for introducing the target into the toroidal chamber of the betatron for irradiation with bremsstrahlung. This arrangement was used in the present work for the investigation of delayed neutrons from photofission. The maximum energies of the bremsstrahlung used were 14.4, 12.5 and 11.4 Mev. The neutron activity reached saturation after 6 min. of irradiation. Four groups of delayed neutrons were found. Their half-lives and relative yields are given in a table. The results are of a preliminary nature. Work is being continued. "The authors express their gratitude to student M. D. Nikonov who participated in the work." Orig. art. has: 1 figure and 1 table.

Card 1/2

L 17583-63 EWT(m)/BDS AFFTC/ASD DM

ACCESSION NR: AP3005226 S/0089/63/015/002/0158/0159

AUTHORS: Malkin, L. Z.; Alkhazov, I. D.; Krivokhatskiy, A. S.; Petrzhak, K. A. 55

TITLE: Half-life periods of spontaneous fission of Pu sup 240 and Pu sup 242

SOURCE: Atomnaya energiya, v. 15, no. 2, 1963, 158-159

TOPIC TAGS: Pu sup 240, Pu sup 242, Pu, scintillation counter, ionization counter

ABSTRACT: Authors used a xenon scintillation counter to measure the half-lives of plutonium isotopes. A double scintillation counter was constructed which permitted a simultaneous measurement of the activity from two identical samples. Surface density of the samples was reduced in this method. Other investigators made measurements with ionization counters. Scintillation counters have the advantage of higher resolution and lesser sensitivity to Alpha particles. Xenon pressure used was 2,5 to 3 atm. The

Card 1/2

L 17583-63

ACCESSION NR: AP3005226

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quantity of Pu sup 240 and Pu sup 242 was determined from their Alpha activity. Thirty-eight and 3/10 fission events per hour were recorded. The half-life of the spontaneous fission of Pu^{240} was 1.45 + or - 0.02 x 10^{11} years; in the case of Pu^{242}, it was 7.45 + or - 0.17 x 10^{10} years. "In conclusion, the authors express their deep gratitude to N. S. Kazakina for preparation of samples." Orig. art. has: 2 figures.

ASSOCIATION: none

SUBMITTED: 14Nov62 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 003 OTHER: 009

Card 2/2

MALKIN, L.Z.; ALKHAZOV, I.D.; KRIVOKHATSKIY, A.S.; PETRZHAK, K.A.; BELOV, L.M.

Energy distribution of spontaneous fission fragments of Cm^{244}. Atom. energ. 15 no.3:249-250 S '63. (MIRA 16:10)

(Curium) (Nuclear fission)

PETRZHAK, K.A.; SEDLETSKIY, P.V.

Radiochemical study of the yields of elements of the [illegible] group in U^{238} photofission. At. m. energ. 15 n...: [illegible] '63. (MIRA . :)

KOVALENKO, S.S.; PETRZHAK, K.A.; [illegible].M.

Total kinetic energy of [illegible] and Th[illegible] fission fragments. At. energ. 15 no.4:320-321 O '[illegible]. (MIRA 1[illegible])

PETRZHAK, K.A.; P[illegible]LIKANOV, [illegible].

Georgii Nikolaevich F[illegible], on [illegible] [illegible]th birthday. Usp. [illegible]
80 no.4:70[illegible] Ag '63.
(MIRA [illegible])

ACCESSION NR: AP4041014 S/0120/64/000/003/0047/0051

AUTHOR: Kondrat'ko, M. Ya.; Nikotin, O. P.; Petrzhak, K. A.

TITLE: Measuring absolute beta-activity of 1—10-mg/cm^2-thick preparations

SOURCE: Pribory* i tekhnika eksperimenta, no. 3, 1964, 47-51

TOPIC TAGS: beta activity, beta activity measurement, 4 pi counter, radiochemistry, gas flow counter

ABSTRACT: Methane-filled flow-type proportional 4-π counters with a plateau slope under 0.5%/100 v within 2,600—3,300 v or 3,400—4,100 v with a 20- or 40-micron anode, respectively, were used for measuring small activities under conditions of heavy shielding (a 15-cm steel shield deep underground, in the Leningrad subway system); the background count was 3 pulse/min for 30-mm and 1.3—1.5 pulse/min for 20-mm counters. The radioactive layer was prepared by centrifuging a finely dispersed liquid suspension upon a 5-micron Al foil. The

Card 1/2

ACCESSION NR: AP4041014

effect of thickness on self-absorption was studied in eight isotopes having a simple beta-decay mode: S^{35}, Ca^{45}, Co^{60}, Br^{82}, Tl^{204}, Sr^{89}, P^{32}, and Y^{90}; also in complex beta radiators: Mo^{99}, Mn^{56}, and $Sr^{90}+Y^{90}$. The self-absorption for various effective numbers of the tagged sediment was studied with a soft (S^{35}) and a hard (P^{32}) beta radiation. The 4-π counter is recommended as an instrument for the absolute measurement of beta activity of "weighable" preparations; barring the softest beta radiators, the error involved is 2 or 3%. Orig. art. has: 4 figures, 1 formula, and 1 table.

ASSOCIATION: none

SUBMITTED: 07Jun63 ENCL: 00

SUB CODE: NP NO REF SOV: 007 OTHER: 004

Card 2/2

KOSTOCHKIN, O.I.; PETRZHAK, K.A.; SOKOLOV, A.M.; SHPAKOV, V.I.

A 4-π counter for measuring the radioactivity of gaseous products. Prib. i tekh. eksp. 9 no.3:52-55 My-Je '64
(MIRA 18:1)

ACCESSION NR: AP4015564 S/0089/64/016/002/0144/0145

AUTHOR: Drapchinskiy, L. V.; Kovalenko, S. S.: Petrzhak, K. A.; Tyutyugin, I. I.

TITLE: Probability ratio of the triple splitting of U sup 235 and U sup 238 by a neutron of various energies

SOURCE: Atomnaya energiya, v. 16, no. 2, 1964, 144-145

TOPIC TAGS: triple splitting, probability, U sup 235, U sup 238, thermal neutron, fast neutron, heavy water

ABSTRACT: The authors have investigated the probability of triple splitting of U^{235} and U^{238} by thermal neutrons and by neutrons of 2.5 and 14 Mev energy. The thermal neutrons were obtained by slowing down neutrons of 2.5 Mev in paraffin, and the fast neutrons were obtained from the reactions $D(d,n)He^3$ for 2.5 and $T(d,n)He^4$ for 14 Mev respectively. The results show that the probability of a triple splitting does not change (within experimental errors of about 10%) with neutron energy. This is at variance with the results of N. A.

Card 1/2

ACCESSION NR: AP4015564

Perfilov et al. (Atomnaya energiya, v. 14 (1963), 575). Orig. art. has: 2 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 24Jun63	DATE ACQ: 12Mar64	ENCL: 00
SUB CODE: PH	NO REF SOV: 002	OTHER: 002

2/2

Card

MALKIN, L.Z.; ALKHAZOV, I.D.; KRIVOKHATSKIY, A.S.; PETRZHAK, K.A.; BELOV, L.M.

Spontaneous fission of Cm^{244} with emission of a long-range α-particle. Atom. energ. 16 no.2:148-149 F '64. (MIRA 17:3)

ARON, P.M.; KOSTOCHKIN, O.I.; PETRZHAK, K.A.; SHPAKOV, V.I.

Probability of delayed neutron emission from halogens. Atom. energ. 16 no. 4:368-370 Ap '64. (MIRA 17:5)

ARON, P.M.; BUGORKOV, S.S.; PETRZHAK, K.A.; SOROKINA, A.V.

Radiochemical determination of the cross section of the $Al^{27}(n,\alpha)Na^{24}$ reaction at a neutron energy of 14.6 Mev. Atom.energ. 16 no. 4:370-372 Ap '64. (MIRA 17:5)

ACC NR: AP7006225 SOURCE CODE: UR/0367/67/005/001/0042/0048

AUTHOR: Adamov, V. M.; Drapchinskiy, L. V.; Kovalenko, S. S.; Petrzhak, K. A.; Tyutyugin, I. I.

ORG: none

TITLE: Neutrons and gamma-quanta at spontaneous ternary fission of Cm^{244}

SOURCE: Yadernaya fizika, v. 5, no. 1, 1967, 42-48

TOPIC TAGS: nuclear fission, fission product, prompt neutron, gamma quantum, ALPHA PARTICLE, CURIUM, ISOTOPE

ABSTRACT: An investigation was made of the dependence of the average number of prompt neutrons ($\bar{\nu}_{tr}$) and gamma-quanta ($\bar{n}_{tr}$) on the energy of alpha-particles and the interrelationship of energy distribution of alpha-particles and gamma-quanta at a spontaneous ternary fission of Cm^{244}. The fission fragments were recorded by a small ionization chamber; the alpha particles with a CsJ(Tl) crystal; the neutrons with a stilbene crystal; and the gamma quanta with NaJ(Tl) crystal. An electronic device recorded simultaneously the number of binary coincidences of neutrons (gamma-quanta) and fragments ($N_{n(\gamma)\text{-frag}}$); the number of binary coincidences of alpha-particles and fragments ($N_{\alpha\text{-frag}}$); and the number of ternary coincidences of alpha-particles, neutrons (gamma-quanta), and fragment ($N_{\alpha\text{-}n(\gamma)\text{-frag}}$). Preliminary measurements of the dependence of $\bar{\nu}_{tr}$ and $\bar{n}_{tr}$ on the energy of alpha particles were carried out with the same target. The determined ratios for average numbers of prompt neutrons and gamma-quanta for ternary and binary spontaneous fission of Cm^{244} were

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ACC NR: AP7006225

$\bar{\nu}_{tr}/\bar{\nu} = 0.58 \pm 0.07$ and $\bar{n}_{tr}/\bar{n} = 0.88 \pm 0.09$, respectively. An investigation of the dependence of $\bar{\nu}_{tr}$ and $\bar{n}_{tr}$ on the alpha-particle energy showed that when the energy of the alpha-particle changes from 15 to 25 Mev, $\bar{\nu}_{tr}$ decreases from 1.95 to 1.16, while $\bar{n}_{tr}$ remains constant. This indicates that the ternary fission mechanism is two-staged. Correlated energy distributions of ternary fission of gamma-quanta and alpha-particles were obtained. An analysis showed that the gamma-quanta energy distributions do not depend significantly on the alpha-particle energy. The binary and ternary gamma-quanta spectra were also identical. It follows that no significant gamma-radiation directly connected with the alpha-particle emission is emitted in the ternary fission. The authors thank A. S. Krivokhatskiy, B. M. Aleksandrov, and N. A. Malyshev for the Cm^{244} targets. Orig. art. has: 6 figures. [WA-95] [JA]

SUB CODE: 20/ SUBM DATE: none/

Card 2/2

L 14679-66 EWT(m)/EPF(n)-2/EWA(h) DM

ACC NR: AP6008259 SOURCE CODE: UR/0089/65/019/002/0185/0185

AUTHOR: Nikotin, O. P.; Petrzhak, K. A.

ORG: none

TITLE: Relative abundances of delayed neutron groups from photofission of sup 238 U

SOURCE: Atomnaya energiya, v. 19, no. 2, 1965, 185

TOPIC TAGS: uranium, isotope, nuclear fission, bremsstrahlung, betatron, neutron

ABSTRACT: Relative yields of delayed neutrons in ^{238}U fission by bremsstrahlung at energies of 10 to 15 Mev were studied using 15 x 10 x 3 mm uranium plate irradiated inside of a betatron. The results of 700 irradiations revealed six groups of delayed neutrons with half life periods 55.0 ± 2.0, 21.0 ± 0.6, 5.4 ± 0.3, 2.2 ± 0.2, 0.7 ± 0.2, and 0.18 ± 0.03 sec; the relative yields from these groups at 14.0 Mev were 0.020 ± 0.001, 0.158 ± 0.008, 0.142 ± 0.012, 0.340 ± 0.014, 0.180 ± 0.010, and 0.160 ± 0.020, respectively. Corrections made for detector efficiency as a function of the neutron energies are discussed. Orig. art. has: 2 figures.

SUB CODE: 18, 20 / SUBM DATE: —Aug65 / ORIG REF: 001 / OTH REF: 003

Card 1/1 UDC: 539.173.3

[redacted]

Yields of [redacted] neutrons in the fission of [redacted] and ^{232}Th with [redacted] 14.5 Mev. Radiokhimiia 7 no.1:96-103 '65. (MIRA 18:6)

L 5068-66 EWT(m)/EWA(h) DM

ACC NR: AP5022640 UR/0089/65/019/002/0185/0186
539.173.3

32
B

AUTHOR: Nikotin, O. P.; Petrzhak, K. A.

TITLE: Relative yields of delayed neutron groups in U238 photofission

19

SOURCE: Atomnaya energiya, v. 19, no. 2, 1965, 185-186

TOPIC TAGS: nuclear radiation, thermal neutron, nuclear physics apparatus

ABSTRACT: The relative yields of delayed neutrons were investigated by means of a slowing-down action of irradiated quanta having a maximum energy of 10 to 15 Mev. An uranium 15 x 10 x 3 mm plate was used as a target placed inside betatron chamber. The target was irradiated either during 10 sec or during the time interval needed for the saturation of neutron activity. A system of proportional counters in a paraffin moderator was used for checking delayed neutrons. The system was also provided with an amplifier discriminator and a 55-channel pulse analyzer. The total time of neutron monitoring was about 280 sec. Six groups of delayed neutrons were obtained with an

Card 1/2

L 5068-66

ACC NR: AP5022640

average half-life of 55, 21, 5.4, 2.2, 0.7 and 0.18 sec. Their average relative yields at 14 Mev were 0.02, 0.158, 0.142, 0.340, 0.180 and 0.160. The detection efficiency depending upon the neutron energy was taken into account. Orig. art. has: 2 graphs.

ASSOCIATION: None

SUBMITTED: 050ct64 ENCL: 00 SUB CODE: NP

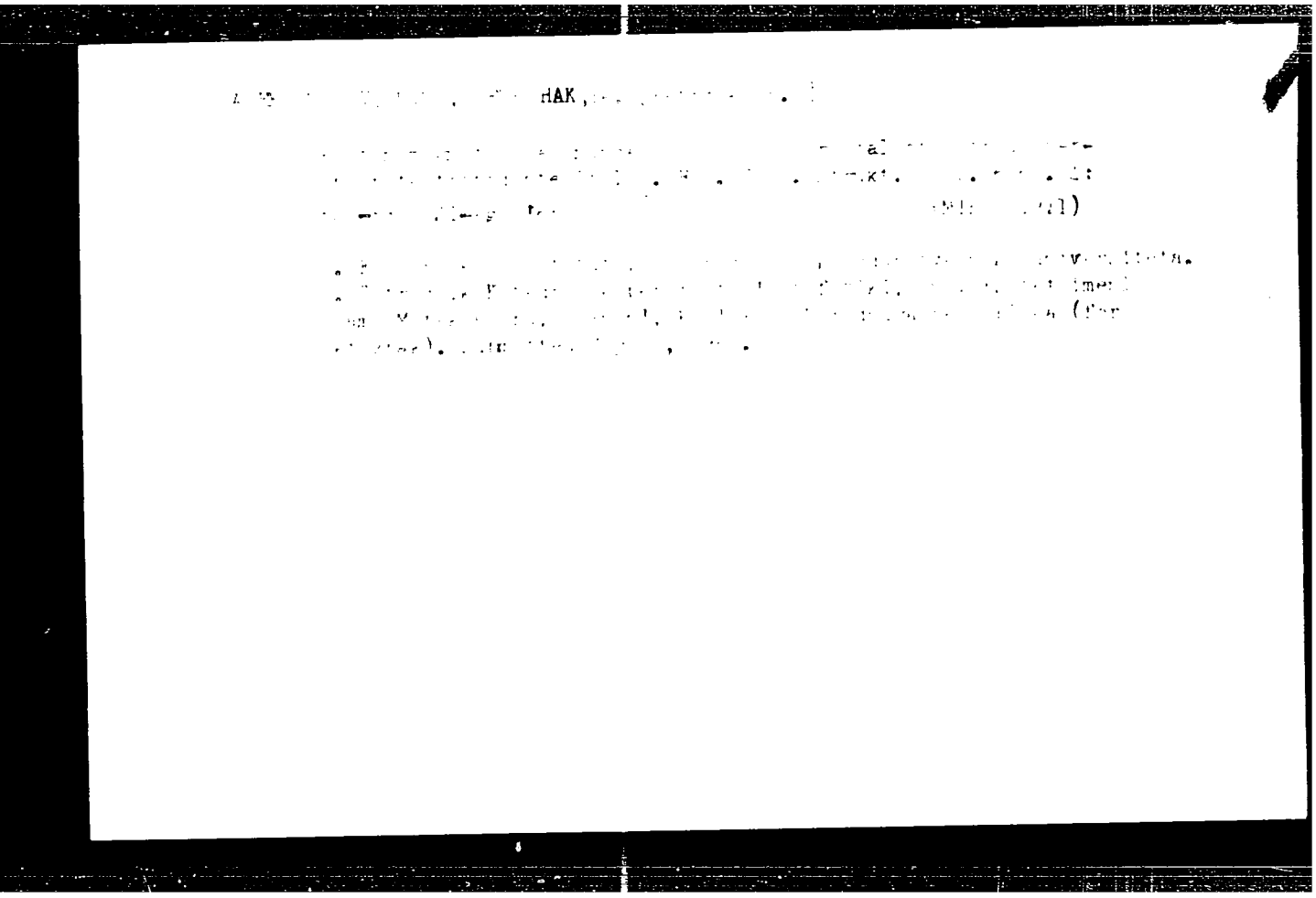
NO REF SOV: 001 OTHER: 003

Card 2/2 nd

LOPATENOK, Al.A.; LOPATENOK, An.A.; PETRZHAK, K.K.; DENISENKO, A.I.

Synthesis of iodinated cellulose derivatives and experimental checking of the products obtained for possible use in surgical practice. Eksp. khir. i anest. 8 no.5:21-28 S-O '63.

(MIRA 17:1)



L 31086-66
ACC NR: AT6022824

SOURCE CODE: HU/2505/65/028/003/0277/0285

AUTHOR: Golda, Voroslav; Petrek, J.--Petrzhek, I.; Lisonek, P.

ORG: Laboratory of Higher Nervous Activity, Palacky University, Olomouc, Czechoslovakia; Department of Anatomy, Palacky University, Olomouc, Czechoslovakia

TITLE: Somatotopical afferent projection of the limbs into the motor cortex in the cat 22

SOURCE: Academia scientiarum hungaricae. Acta physiologica, v. 28, no. 3, 1965, 277-286

TOPIC TOPICS: cerebral cortex, cat, neurophysiology

ABSTRACT: Somatotopical afferent projections not only to the sensory areas but also to the motor cortex were revealed by chronic experiments in the cat. Cortical responses were evoked by electric stimulation of the skin of the contralateral limb in the waking state and under chloralose or pentobarbital anesthesia. On stimulation of the forelimb, primary evoked potentials dominated in the somatotopical areas, while a stimulation of the hindlimb resulted in amplitudes which were higher in the delayed component than in the early ones. These findings suggest that these cortical evoked responses are mediated via pathways with different oligo- and multisynaptic afferent proportions. Cytological analyses of the foreleg and hindleg areas of the motor cortex

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L 31086-66
ACC NR: AT6022824

support the assumption of Tarnecki and Konorski (1963) that the sensory area for the forelimb is larger than generally believed and partially overlaps the motor cortex. The authors thank Prof. K. Lissak and Assoc. Prof. E. Grastyan for interest and encouragement throughout this study and helpful suggestions during the course of experiments on freely moving animals. Orig. art. has: 4 figures. [Orig. art. in Eng.] [JPRS]

SUB CODE: 06 / SUBM DATE: 05Aug64 / ORIG REF: 004 / OTH REF: 013

Card 2/2 CC

KR[illegible], I.[illegible], N[illegible], V.[illegible], [illegible]IK, [illegible]

Development of methods [illegible] uniform [illegible] blend fabrics. [illegible] [illegible] 294 '64. [illegible]